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PTO/SB/05 (4/98)
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UTILITY PATENT APPLICATION TRANSMITTAL

Only for new nonprovisional applications under 37 C.F.R. § 1.53(b)

Attorney Docket No.	1620/76982
First Inventor or Application Identifier	Ekkert
Title	Cap and container assembly
Express Mail Label No.	EL133503808US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents

ADDRESS TO: Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

1. [X] *Fee Transmittal Form (e.g. PTO/SB/17) (Submit an original and a duplicate for fee processing)

2. [X] Specification (preferred arrangement set forth below) Total Pages: 15
- Descriptive title of the Invention
- Cross References to Related Applications
- Statement Regarding Fed sponsored R & D
- Reference to Microfiche Appendix
- Background of the Invention
- Brief Summary of the Invention
- Brief Description of the Drawings *(if filed)*
- Detailed Description
- Claim(s)
- Abstract of the Disclosure

3. [X] Drawing(s) (*35 U.S.C. 113*) Total Sheets: 4

4. Oath or Declaration Total Pages: 2
   a. [X] Newly executed (original or copy)
   b. [ ] Copy from a prior application (37 C.F.R. § 1.63(d)) *(for continuation/divisional with Box 16 completed)*
      i. [ ] DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

5. [ ] Microfiche Computer Program (*Appendix*)

6. Nucleotide and/or Amino Acid Sequence Submission (*if applicable, all necessary*)
   a. [ ] Computer Readable Copy
   b. [ ] Paper Copy (identical to computer copy)
   c. [ ] Statement verifying identify of above copies

ACCOMPANYING APPLICATION PARTS

7. [X] Assignment Papers (cover sheet & document(s))
8. [ ] 37. C.F.R. § 3.73(b) Statement (*when there is an assignee*) [ ] Power of Attorney
9. [ ] English Translation Document (*if applicable*)
10. [X] Information Disclosure Statement (IDS) PTO-1449 [X] Copies of IDS Citations
11. [ ] Preliminary Amendment
12. [X] Return Receipt Postcard (MPEP 503) (*Should be specifically itemized*)
13. [X] *Small Entity Statement(s) (*PTO/SB/09-12*)0 [ ] Statement filed in Prior application, Status still proper and desired
14. [ ] Certified Copy of Priority Document(s) (*if foreign priority is claimed*)
15. [ ] Other: _____

*NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).

16. **If a CONTINUING APPLICATION**, *check appropriate box, and supply the requisite information below and in a preliminary amendment*

[ ] Continuation [ ] Divisional [ ] Continuation-In-Part (CIP) Of prior application No.: _____ / _____

Prior application information: Examiner _____ Group/Art Unit: _____

FOR CONTINUATION or DIVISIONAL APPS ONLY; The entire disclosure of the prior application, from which an oath or declarations supplied Under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by Reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

17. CORRESPONDENCE ADDRESS

[ ] *Customer Number or Bar Code Label* *(Insert Customer No. or attach bar code label here)* or [X] *Correspondence address below*

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Name *Print/Type*)	L. Friedman	Registration No. (*Attorney/Agent*)	37135
Signature		Date	29 December 1999

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Office, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO. Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231

Applicant or Patentee: Ekkert
Serial or Patent No.:
Filed or Issued:
For: CAP AND CONTAINER ASSEMBLY

Atty Docket No. 1620/76982

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS

(37 CFR 1.9(f) AND 1.27(c) - SMALL BUSINESS CONCERN)

I hereby declare that I am

( ) the owner of the small business concern identified below:
(X) an official of the small business concern empowered to act on behalf of the concern identified below:

NAME OF CONCERN: Phoenix Closures, Inc.
ADDRESS OF CONCERN: 1899 High Grove Lane, Naperville, Illinois 60540

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.12, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees to the United States Patent and Trademark Office, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time, or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled:

CAP AND CONTAINER ASSEMBLY

by inventor(s): Ekkert
described in:

(X) the specification filed herewith.
( ) application serial no. _____, filed _____.
( ) Patent No. _____, issued _____.

If the rights held by the above-identified small business concern are not exclusive, each individual, concern, or organization having rights to the invention is listed below* and no rights to the invention are held by any person, other than the inventor, who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person made the invention, or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d), or a nonprofit organization under 37 CFR 1.9(e).
*NOTE: Separate verified statements are required from each named person, concern, or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

NAME
ADDRESS

( ) INDIVIDUAL( ) SMALL BUSINESS CONCERN ( ) NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING: Len Ekkert
TITLE OF PERSON OTHER THAN OWNER: Vice President
ADDRESS OF PERSON SIGNING: 1899 High Grove Lane, Naperville, Illinois 60540
SIGNATURE: Len Ekkert
Date: Dec 10, 1999

PATENT APPLICATION
1620/76982

I hereby certify that this paper is being deposited with the United States Postal Service as Express Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on this date.
29 DEC 1999 V Hughes
Date
EL133503808US
Express Mail Label No.

CAP AND CONTAINER ASSEMBLY

BACKGROUND AND SUMMARY

This invention relates to containers which can be opened and closed repeatedly and continue to achieve a good seal between the cap and the container.

A good seal is especially desirable if the substance in the container needs protection from the outside environment, such as a powdered beverage mix which can cake with continuous exposure to very humid air. It is desirable to be able to manufacture an inexpensive cap and container assembly, which can be used for initial packaging of the product prior to sale, and which can continue to be opened and resealed by the purchaser of the product.

Some existing containers are too expensive for the packaging of inexpensive products, difficult to reseal effectively, or simply cannot be resealed effectively.

The present invention is a novel cap and container assembly which can repeatedly achieve a good seal. Annular protrusions depend from a curved cap top, and the top of the container neck slants out, then in, and then out as the neck extends down from the mouth of the container. As the cap is secured to the container, the protrusions engage exterior and interior surfaces of the neck, and the curved cap top and the upper part of the neck flex to facilitate forming a good seal. Stopping surfaces form a positive stop to lower engagement of the cap with respect

to the container beyond a certain point, limiting the temporary deformation of shape caused by the flexing. The dimensions of the protrusions and the neck surfaces are matched to achieve a good seal at the lowest engagement of the cap with respect to the container permitted by the stopping surfaces.

The features of the present invention which are believed to be novel are set forth below with particularity in the claims. The invention, together with further advantages thereof, may be understood by reference to the following description in conjunction with the accompanying figures, which illustrate some embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a side perspective view of the cap and container assembly with the cap secured to the container.

FIG. **2** is a top perspective view of the cap and container assembly.

FIG. **3** is a cross-sectional view taken along line 3-3 depicted in FIG. **2**.

FIG. **4** is an enlarged view of the identified portion in FIG. **3**.

FIG. **5** is a similar view as illustrated in FIG. **4**, but of an alternative embodiment.

DETAILED DESCRIPTION

FIGS. **1** through **4** show an example of the present cap and container assembly. It comprises a container **10** and a cap **20** designed for mating engagement with each other. The container **10** and cap **20** are manufactured as molded plasic parts, preferably composed of polypropylene, polyethylene, or similar materials.

As best seen in FIG. **3**, the container **10** includes a base **11** and a neck **12**. The neck **12** is the portion of the container **10** to which the cap **20** is engaged, and the end of the neck **12** defines a mouth of the container. The cap **20** includes a curved top **21** and a skirt **22** depending peripherally from the top **21**. A portion of the exterior surface of the neck **12** is threaded, a portion of the interior surface of the skirt **22** is threaded, and the cap **20** can be secured to the container **10** by mating engagement of those two threaded-portions. A number of stops or projections **23** on the interior surface of the skirt **22** are designed to contact a shoulder **13** on the exterior surface of the neck **12** at a certain point as the cap **20** is secured to the container **10**. Those projections **23** and shoulder **13** act as stopping surfaces to stop any lower engagement of the cap **20** with respect to the container **10** and to provide a gap **14** between a bottom edge of the cap **20** and an upper part of the base **11**. In FIGS. **3** and **4**, the shoulder **13** is seen above the threaded portion of the exterior surface of the neck **12**.

As best seen in FIGS. **3** and **4**, a relatively long sealing flange or first annular protrusion **24** and a plurality of much

smaller second annular protrusions **25** depend from an interior surface of the top **21**. The top **21** is generally convex as viewed from inside the cap **20**. The neck **12** is substantially symmetrical about a central vertical axis. As the neck **12** extends down from the mouth, it is preferable if the neck **12** initially doubles back creating a flexible lip and then has a lower interior sealing surface **17** for sealing with the first protrusion **24**, before extending down to the threaded portion. That is, the neck **12** initially becomes wider forming an upper exterior sealing surface **15** at an angle of about 10° to about 20°, and preferably about 15°, with an imaginary horizontal plane in an unstressed state. The second annular protrusions **25** are positioned to engage this upper exterior sealing surface **15** of the neck **12**. It is preferable that the neck **12** then become narrower first forming an exterior surface **16** at an angle of about 10° to about 25°, and preferably about 20°, with an imaginary horizontal plane, and second becoming more vertical while continuing to narrow and forming the lower interior sealing surface **17** at an angle of about 10° to about 20°, and preferably about 14°, with a surface of an imaginary vertical cylinder (in an unstressed state). The first annular protrusion **24** can engage this lower interior sealing surface **17** of the neck **12**. The neck **12** can then become wider than the lip as it continues down to meet the base **11**.

The surfaces **15**, **16**, and **17**, like all of the neck **12** in the example illustrated by FIGS. **1** through **4**, curve symmetrically about a central vertical axis. However, the surfaces **15**, **16**, and

17, may be characterized as generally frusto-conical. That is, in a cross-sectional view taken along any plane which includes the central vertical axis, the surfaces **15**, **16**, and **17** would appear as straight line segments. As seen in FIG. **4**, the angle of surface **15**, **16**, or **17**, mentioned above, would be the angle of such a straight line segment - as represented by angles α, β, and γ, respectively.

With the example just described, and illustrated in FIGS. **3** and **4**, the first annular protrusion **24** will protrude down further from the top **21** than the second protrusions **25**, as both are designed to engage and seal with a particular surface area of the neck **12**. It is preferable that materials and the geometry of the top **21**, the first protrusion **24**, and the neck **12** render them sufficiently flexible to allow for some temporary deformation of shape. This is facilitated by the curvature of the top **21** and the bends in the neck **12**. The temporary deformation results from the pressure exerted as the cap **20** is secured to the container **10**. The resilience of the materials used maintains that pressure and the resulting good seal between the cap **20** and the container **10**.

It is preferable that the angles, of the first annular protrusion **24** and of the lower interior sealing surface **17** of the neck **12** with which the first protrusion **24** will engage, are generally matched to achieve a good seal at the lowest engagement permitted by the stopping surfaces **13** and **23**. Similarly, as seen in FIGS. **3** and **4**, the lengths of the second annular protrusions

25 will vary to match the angle of the upper exterior sealing surface 15 of the neck 12 with which the second protrusions 25 will engage. Of course, the particular configuration described is only an example and is not the only one which will work. Upon engagement, the interior surface of the top 21 will be pressed upward, and the upper exterior sealing surface 15 will be pressed downward putting inward pressure on the lower interior sealing surface 17 and on the first protrusion 24.

In addition to facilitating a good seal, the shape of the neck 12, as best seen in FIG. 3, is ergonomically desirable. A typical opened container 10 may be held easily with one hand around the neck 12 below the flexible lip.

As seen in FIG. 3, a bottom section of the neck 12 is generally vertical, and its exterior surface includes the threaded-portion below the shoulder 13. That bottom section of the neck 12 is narrower than the adjacent and integral upper part of the base 11, and the skirt 22 is generally the same diameter as the upper part of the base 11.

As best seen in FIGS. 1 and 3, a gap 14 remains between a bottom edge of the cap 20 and an upper part of the base 11 in the illustrated embodiment, when lower engagement of the cap 20 with respect to the container 10 is blocked by contact between the stopping surfaces 13 and 23. The gap 14 facilitates the cutting of any label or tamper-evident tape applied to the filled cap and container assembly before sale to the consumer.

In an alternative embodiment illustrated, in part, in FIG. **5**, an additional annular protrusion **26** depends down from the interior surface of the top **21**. When the cap **20** is engaged with the container **10**, the additional protrusion **26** is radially outside of the flexible lip of the neck **12**, and is sufficiently rigid and extends low enough and close enough to the lip to resist the lip from moving outwardly when the lip is pressed down upon engagement of the cap **20** with the container **10**. The curved cap top **21** flexes up, causing the rigid additional protrusion **26** to press the flexible lip inwardly. This will maintain the pressure on the sealing surfaces **15** and **17**, and improve the sealing between the upper exterior sealing surface **15** and the second protrusions **25** and between the lower interior sealing surface **17** and the first protrusion **24**. The additional annular protrusion **26** will compensate for manufacturing imperfections, such as a surface of the neck **12** being slightly out of the round, which would diminish the ability to achieve a good seal. The possibility of such imperfections cannot always be eliminated given the tolerances achievable in the manufacture of inexpensive containers.

The embodiments discussed and/or shown in the figures are examples. They are not exclusive ways to practice the present invention, and it should be understood that there is no intent to limit the invention by such disclosure. Rather, it is intended to cover all modifications and alternative constructions and

embodiments that fall within the spirit and the scope of the invention as defined in the following claims:

What is claimed is:

1. A cap and container assembly comprising:

a container and a cap;

the container including a base, and a neck for engagement with the cap, an end of the neck defining a container mouth;

the neck being substantially symmetrical about a central vertical axis, the neck forming a flexible lip, proximate the mouth, with an upper, generally frusto-conical, exterior sealing surface, the neck further forming a lower, generally frusto-conical, interior sealing surface, the neck further forming an exterior circumferential shoulder of greater diameter than a diameter of the lip;

the cap including a top, a skirt depending peripherally from the top, first and second annular sealing protrusions depending from an interior surface of the top, and at least one stopping projection on an interior surface of the skirt;

the top being generally convex as viewed from inside the cap;

wherein, upon securing engagement of the skirt with a bottom section of the neck, the first sealing protrusion sealingly engages the lower interior sealing surface, and the second sealing protrusion sealingly engages the upper exterior sealing surface; and

wherein the shoulder and the at least one stopping projection engage to form a positive stop to lower engagement of

the cap with respect to the container, ensuring sealing contact between the first sealing protrusion and the lower interior sealing surface and between the second sealing protrusion and the upper exterior sealing surface, and forming a gap between a bottom edge of the cap and an upper part of the base.

2. A cap and container assembly as in claim 1 wherein an intersection of the upper exterior sealing surface with any plane which includes the central vertical axis would form a straight line segment which would form an angle of about 10° to about 20° with its projection on an imaginary horizontal plane, and an intersection of the lower interior sealing surface with any plane which includes the central vertical axis would form a straight line segment which would form an angle of about 10° to about 20° with its projection on a surface of an imaginary vertical cylinder.

3. A cap and container assembly comprising:

a container and a cap;

the container including a base, and a neck for sealing engagement with the cap, an end of the neck defining a container mouth;

wherein stopping surfaces of the cap and the container engage to form a positive stop to lower engagement of the cap with respect to the container.

4. A cap and container assembly as in claim 3, the stopping surfaces comprising at least one stopping projection on an interior surface of the cap and a shoulder on an exterior surface of the neck.

5. A cap and container assembly as in claim 3, wherein a gap remains between a bottom edge of the cap and an upper part of the base, upon engagement of the stopping surfaces.

6. A cap and container assembly as in claim 3, wherein the sealing engagement of the cap with the neck temporarily deforms a shape of at least one of a group consisting of the cap and the neck, and wherein an extent of said deformation can be limited upon engagement of the stopping surfaces.

7. A cap and container assembly as in claim 3, the cap including at least one annular protrusion which can sealingly engage an interior surface of the neck.

8. A cap and container assembly as in claim 3, the cap including at least one annular protrusion which can sealingly engage an exterior surface of the neck.

9. A cap and container assembly as in claim 3, the cap including at least one first annular protrusion which can sealingly engage a first surface of the neck and at least one second annular

protrusion which can sealingly engage a second surface of the neck.

10. A cap and container assembly as in claim 9, wherein an interior surface of the neck includes the first surface, and an exterior surface of the neck includes the second surface.

11. A cap and container assembly as in claim 10, the cap further including a top and a skirt depending peripherally from the top;

wherein the cap can be secured to the container by threading engagement of a threaded-portion of an interior surface of the skirt with a threaded-portion of the exterior surface of the neck, the first and second protrusions depend from an interior surface of the top, and the stopping surfaces comprise at least one stopping projection on the interior surface of the skirt and a shoulder on the exterior surface of the neck above the threaded-portion of the exterior surface of the neck.

12. A cap and container assembly comprising:

a container and a cap;

the container including a base, and a neck for engagement with the cap, an end of the neck defining a container mouth;

the neck being substantially symmetrical about a central vertical axis, the neck forming a flexible lip, proximate the mouth, with an upper, generally frusto-conical, exterior sealing surface, the neck further forming a lower, generally frusto-

conical, interior sealing surface, the neck further forming a bottom exterior surface, of greater diameter than the diameter of the lip, for securing engagement with the cap;

the cap including a top, a skirt depending peripherally from the top, at least one first annular sealing protrusion depending from an interior surface of the top, and at least one second annular sealing protrusion depending from the interior surface of the top;

wherein, upon securing engagement of the skirt with the bottom exterior surface of the neck, the at least one first sealing protrusion sealingly engages the lower interior sealing surface, and the at least one second sealing protrusion sealingly engages the upper exterior sealing surface.

13. A cap and container assembly as in claim 12, wherein the sealing engagement of the sealing protrusions with the sealing surfaces, respectively, temporarily deforms a shape of at least one of a group consisting of the cap and the neck.

14. A cap and container assembly as in claim 12, the top of the cap being generally convex as viewed from inside the cap.

15. A cap and container assembly as in claim 12, the cap further including an additional annular protrusion depending from the interior surface of the top, the additional annular protrusion being radially outside of the first and second sealing

protrusions and, upon engagement of the cap with the container, radially outside of the lip;

the additional annular protrusion being sufficiently rigid and extending low enough and close enough to the flexible lip, upon engagement of the cap with the container, to resist the lip from moving outwardly.

16. A cap and container assembly as in claim 12, wherein the cap is manufactured of a flexible plastic material.

17. A cap and container assembly as in claim 12, wherein the container is manufactured of a flexible plastic material.

ABSTRACT

A cap and container assembly can be opened and closed repeatedly and continue to achieve a good seal between the cap and the container. The good seal results from the engagement, of the container neck with cap protrusions, which temporarily deforms the shape of the container and/or the cap as the cap is secured to the container, and from stopping surfaces which limit the extent of that deformation.

FIG. 1

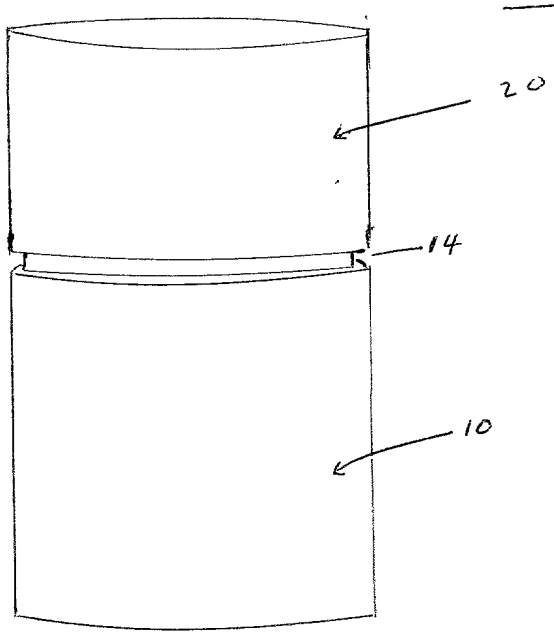


FIG. 2

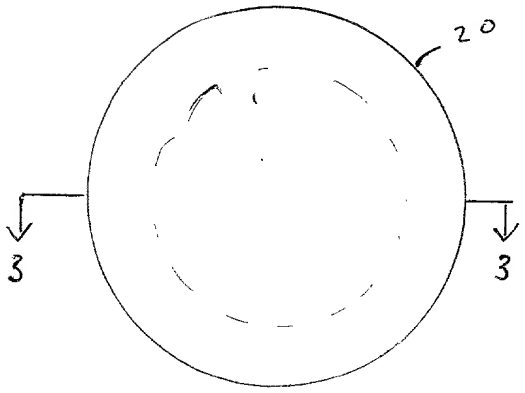


FIG. 3

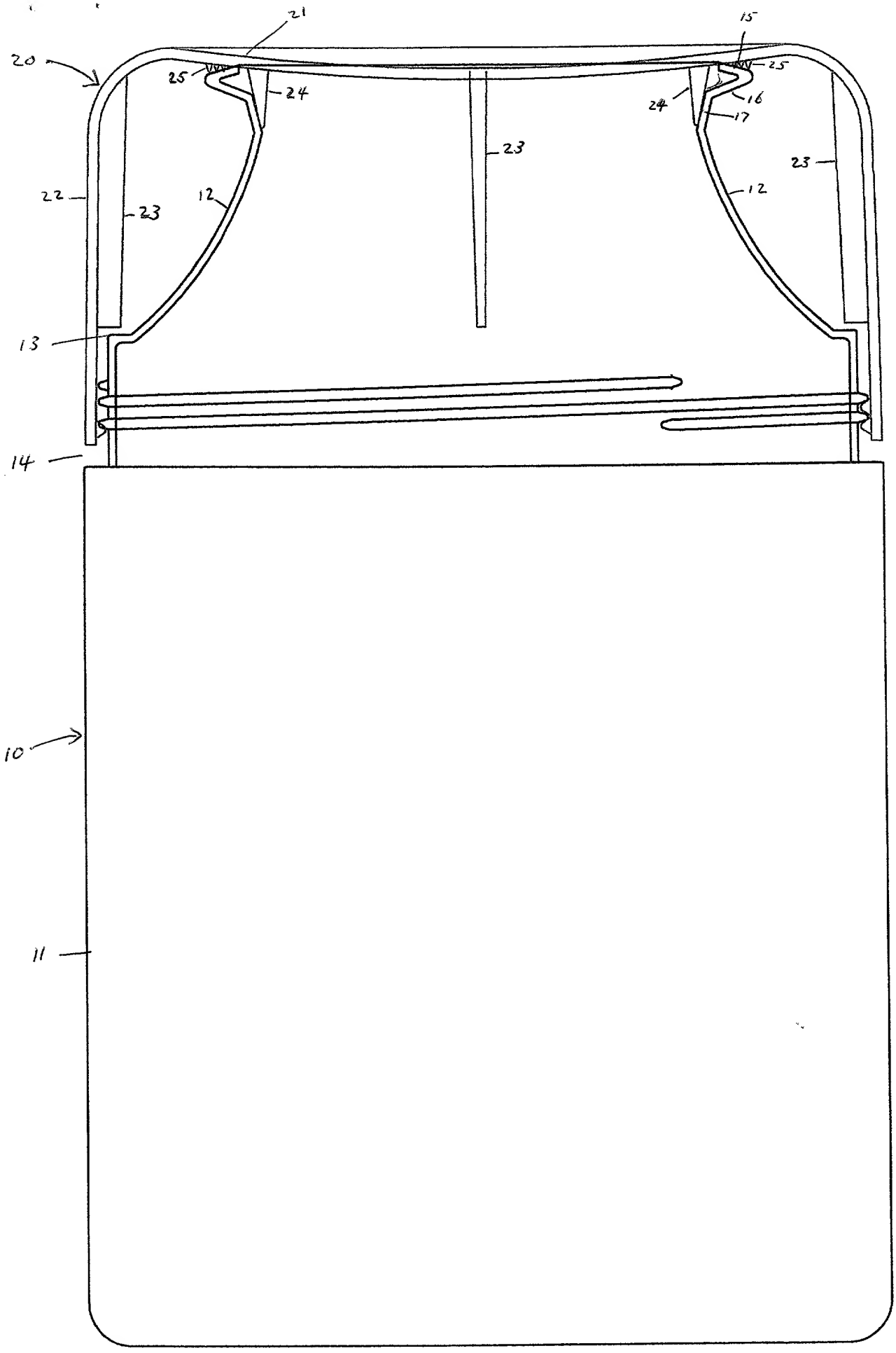


FIG. 4

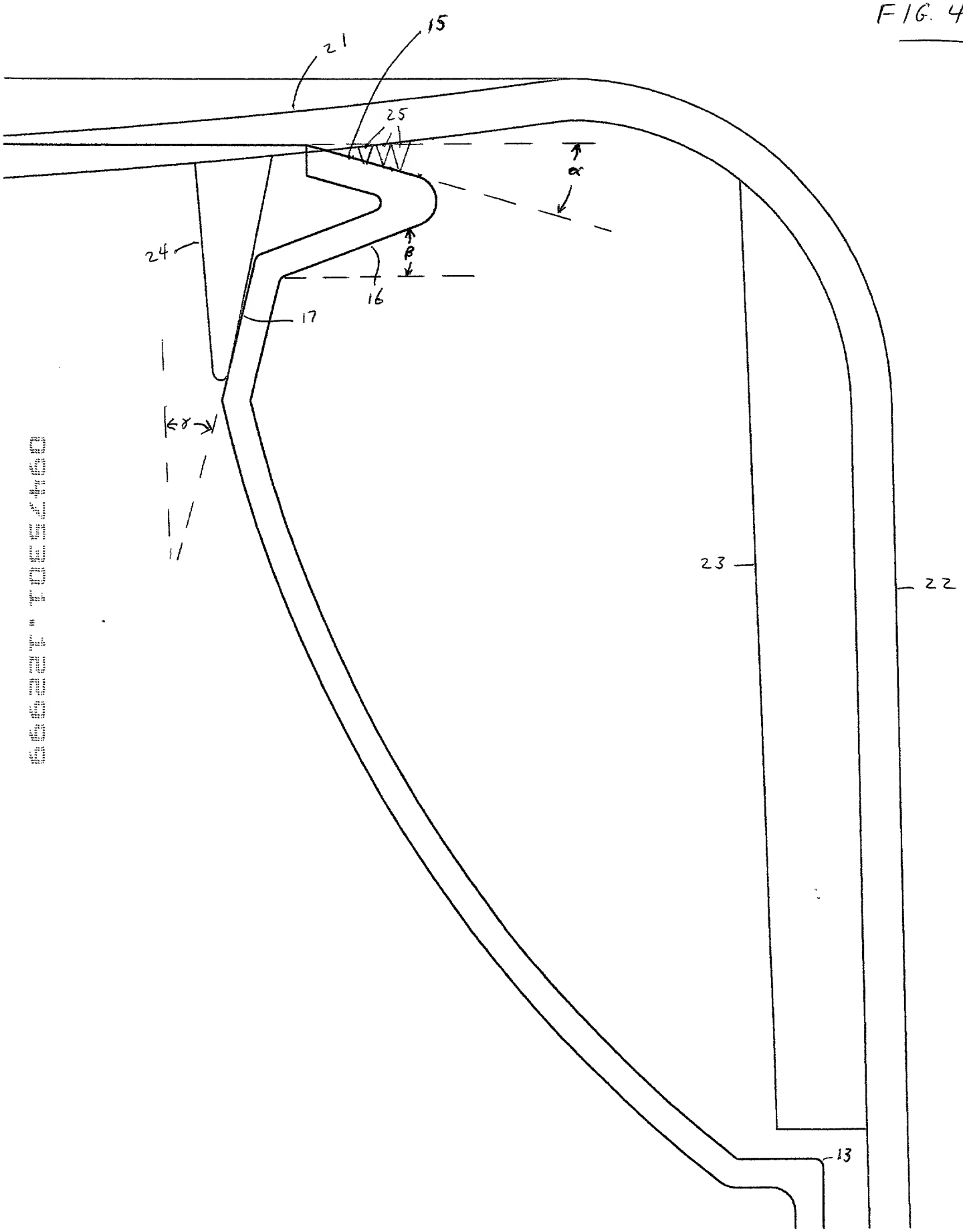
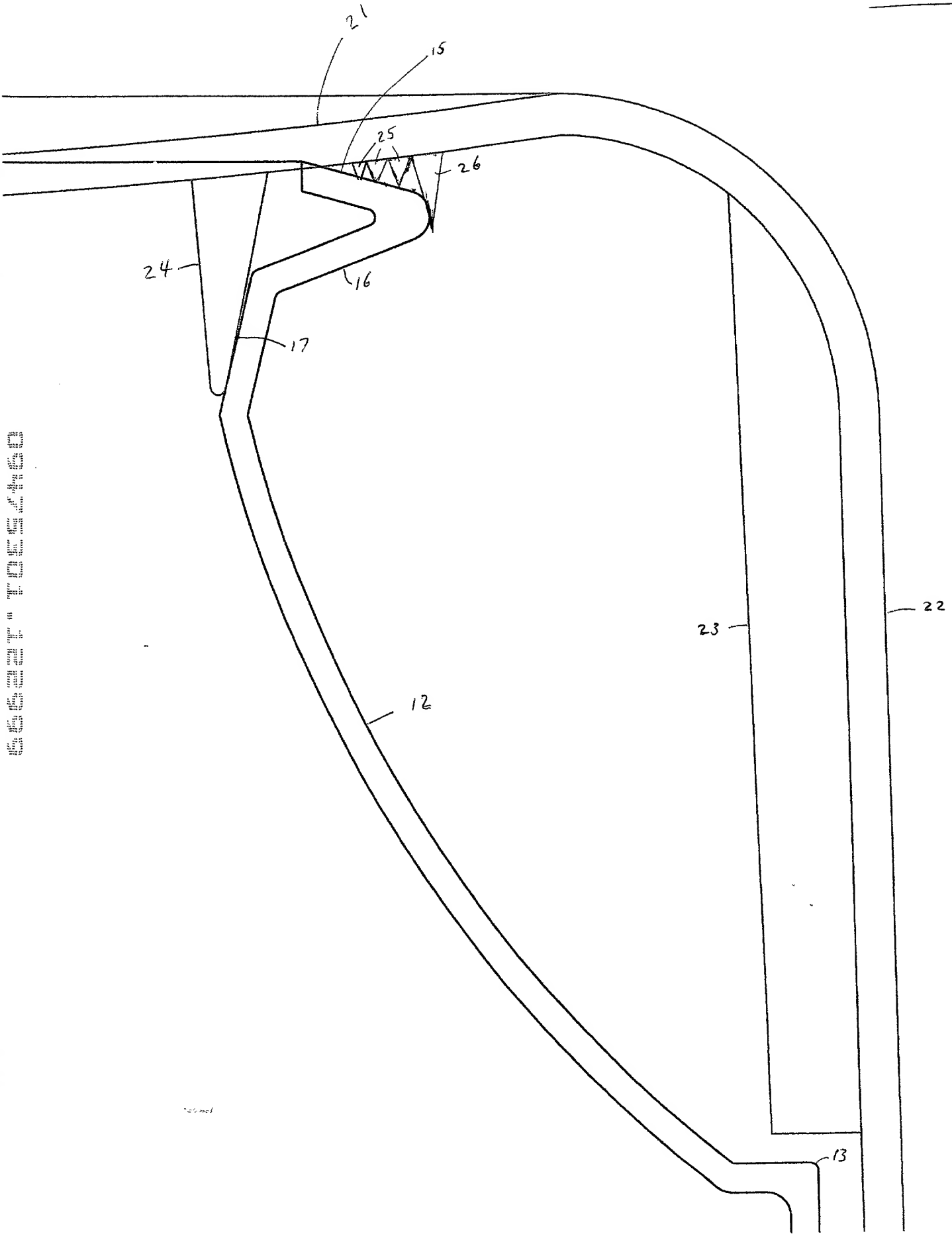


FIG. 5



DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare:

That my residence, post office address and citizenship are as stated below next to my name.

That I verily believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

CAP AND CONTAINER ASSEMBLY

the specification of which (check one)
(X) is attached hereto.
( ) was filed on _____ as
Application Serial No. _____
and was amended on _____
(if applicable)

That I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

That I acknowledge the duty to disclose information known to be material to patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

That I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate on this invention having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

			Priority Claimed
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	☐ Yes ☐ No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year Filed)	☐ Yes ☐ No

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below.

_____ (Application Number) _____ (Filing Date)

_____ (Application Number) _____ (Filing Date)

That I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

United States Application(s)

_____ (Application Serial No.)	_____ (Filing Date)	_____ (Status)-(Patented, pending, abandoned)
_____ (Application Serial No.)	_____ (Filing Date)	_____ (Status)-(Patented, pending, abandoned)

That all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

I hereby appoint the following attorneys, with full power of substitution and revocation, to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith and request that all correspondence and telephone calls in respect to this application be directed to WELSH & KATZ, LTD., 120 South Riverside Plaza, 22nd Floor, Chicago, Illinois 60606, Telephone No. (312) 655-1500:

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Gerald S. Schur	22,053
Gerald T. Shekleton	27,466
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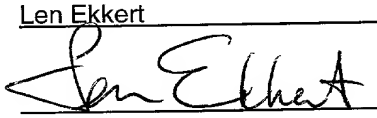
Kathleen A. Rheintgen	34,044
Thomas W. Tolpin	27,600
Jon P. Christensen	34,137
Leonard Friedman	37,135

Full name of sole or one joint inventor: Len Ekkert

Inventor's signature: 

Date: 12-10-99

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Citizenship: United States

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